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## (54) Top-loading bulk transport containers

(57) A container 1 for the bulk transport of, for example, powders or grains, has a top 3 formed by the side-by-side junction of two types of different self-supporting sheet metal panels 5, 6, one type 5 being formed integrally with a loading hatch 2 and having reinforcing ribs 20, 21. Panels 5 also carry covers 4 for the hatches and devices (27, Fig. 5) for locking them. The other panels 6 may have reinforcing ribs 7.

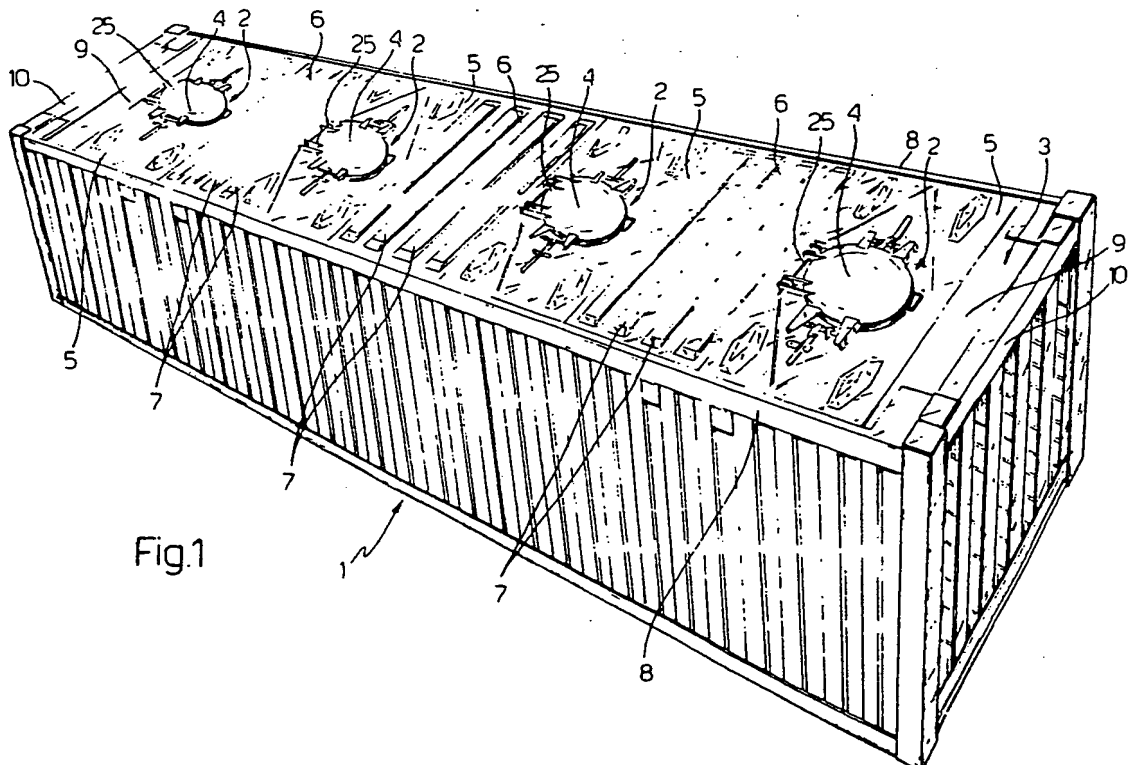


Fig.1

UDC 621.372.6

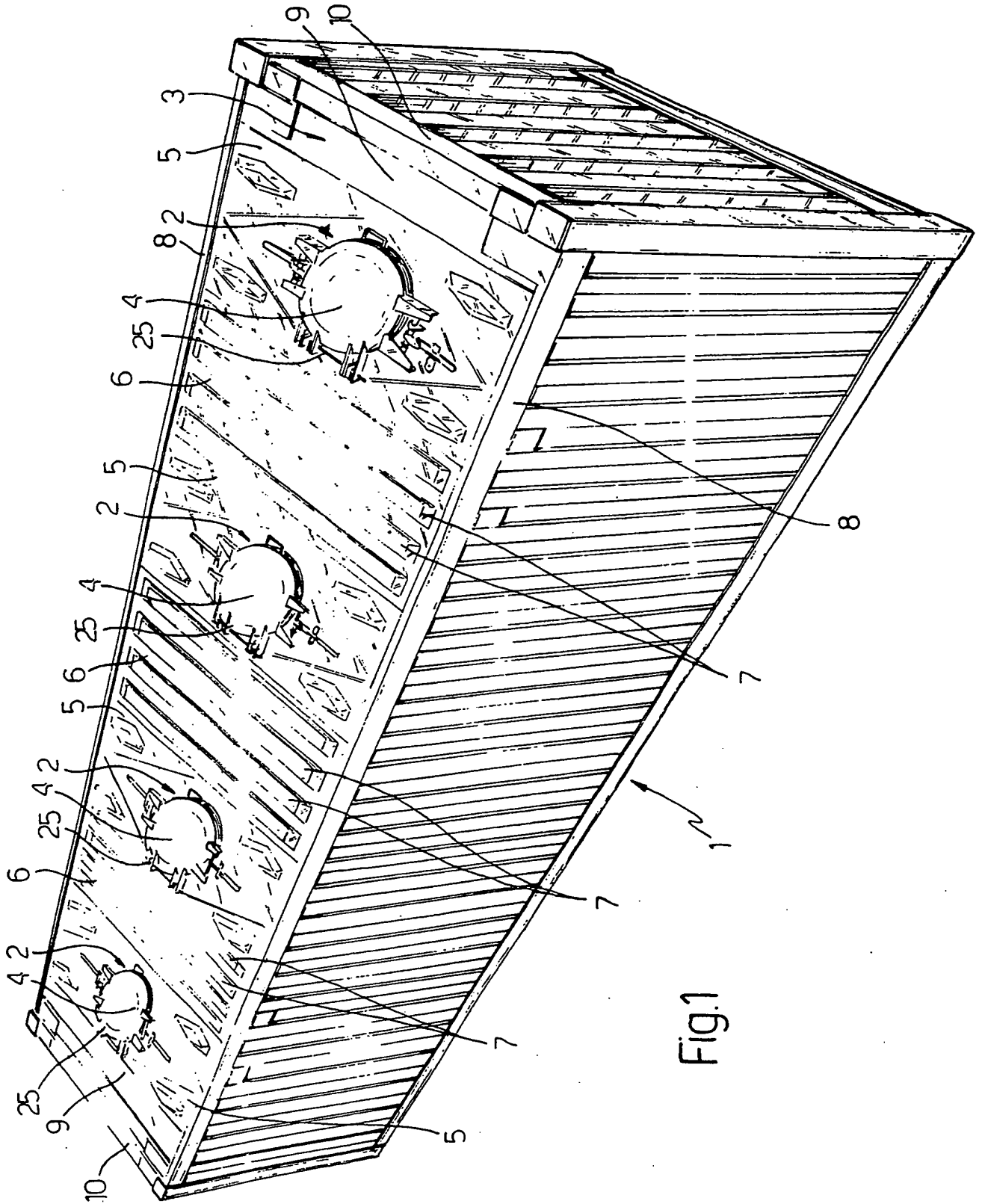


Fig. 1

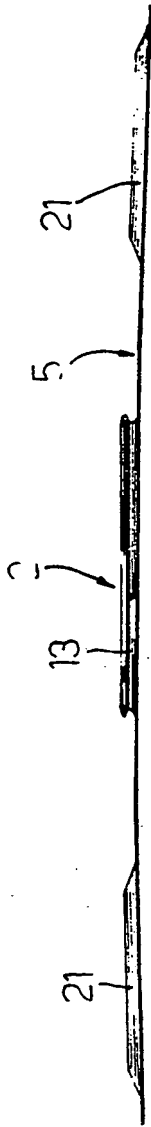


Fig. 3

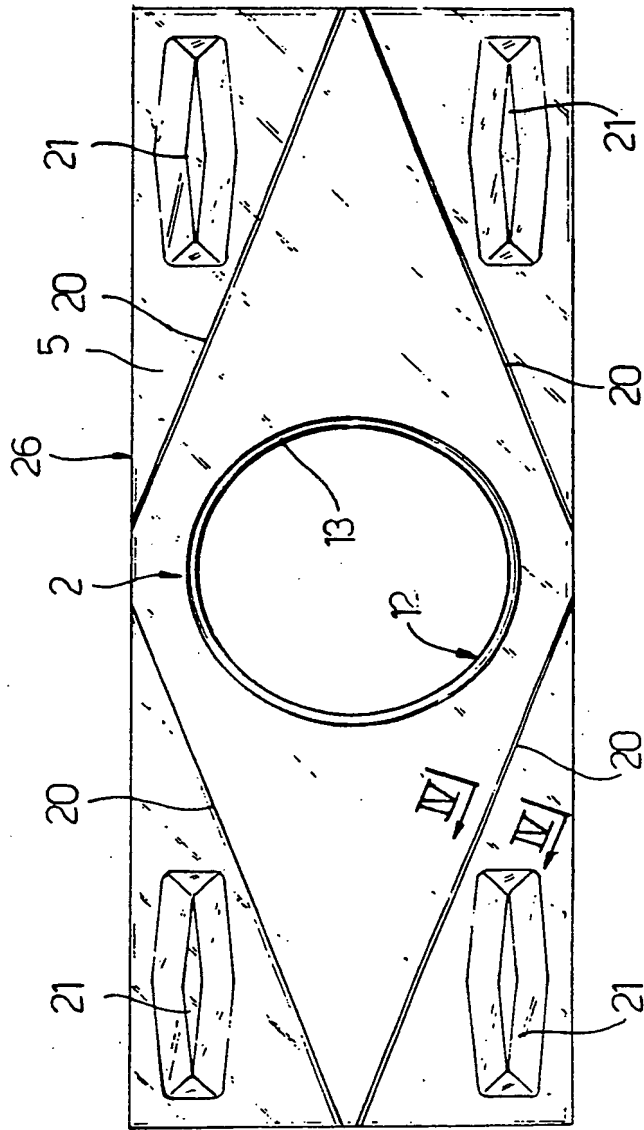


Fig. 2

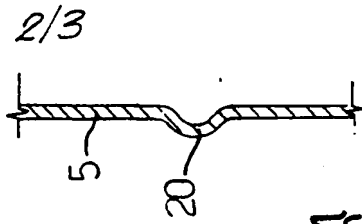
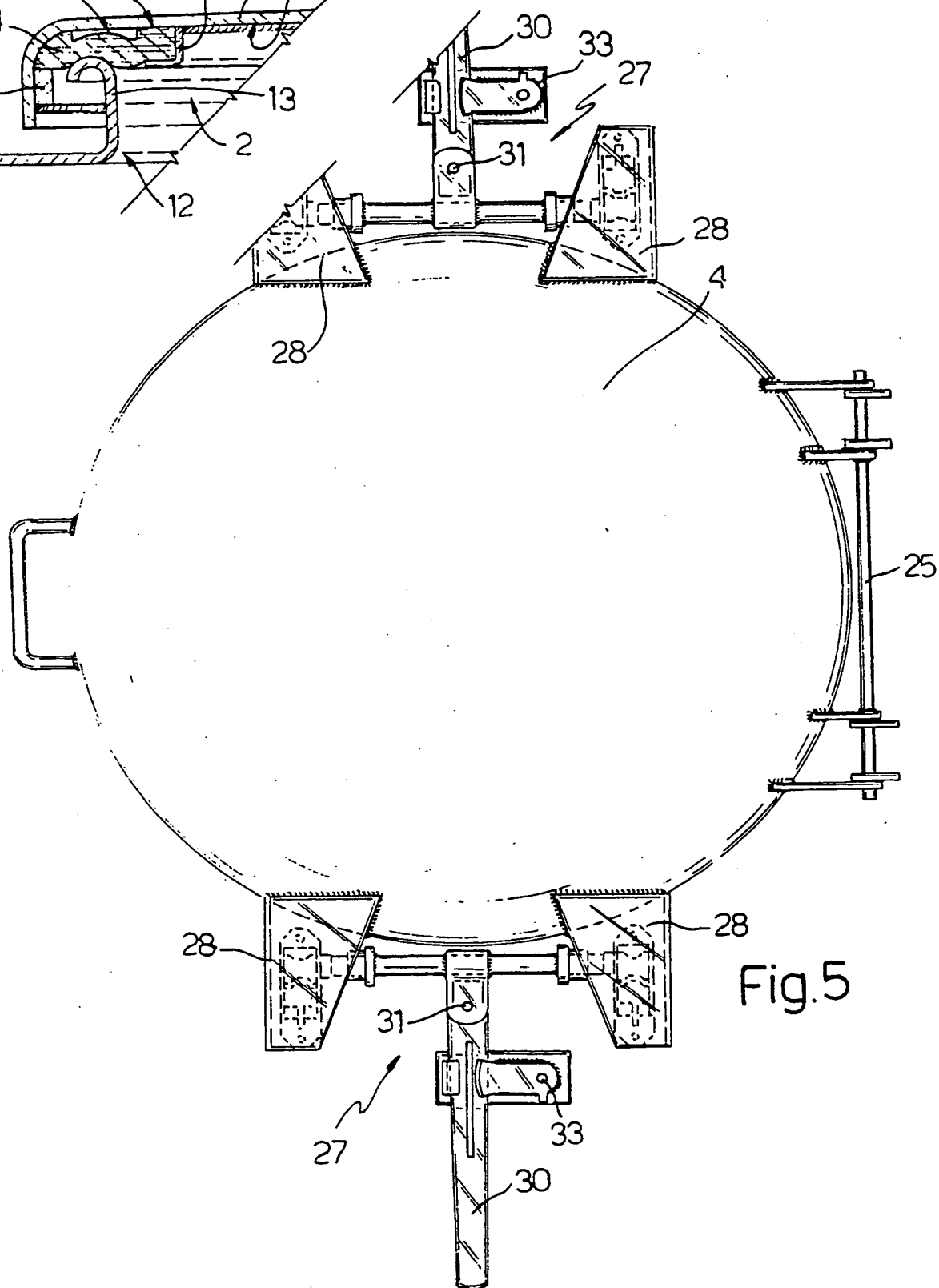
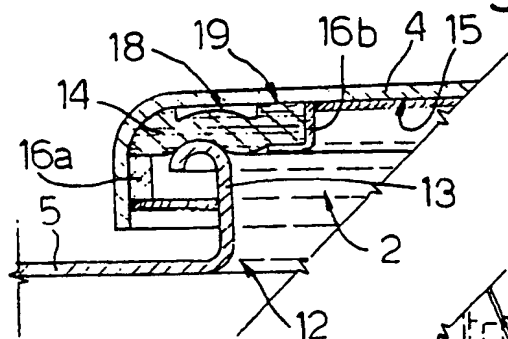


Fig. 4

Fig. 6



"AN IMPROVED CONTAINER OF TOP-LOADING TYPE FOR THE TRANSPORT OF  
BULK GOODS"

5 The present invention relates to an improved container of the type  
which can be loaded from above, for the transport of bulk goods  
such as powders or grains and the like.

10 It is known that containers of the said type are loaded through  
respective upper hatches carried by the top of the container and  
provided with closure covers having associated locks; such hatches,  
which are of standard type and usually produced by specialist  
companies, are fixed to the top of the container upon assembly  
thereof after appropriate seats have been formed thereon; this  
15 procedure, as well as being inconvenient in that it requires long  
assembly times for the fixing of the hatchways to the container  
top, has the disadvantage of not guaranteeing the absence of  
infiltrations in the region of the junction between the hatch and  
the top; the standard hatches used, moreover, do not generally have  
particularly good sealing characteristics against water and  
20 moisture, and in any case such characteristics can be greatly  
reduced by the deformations induced by the operations for fixing to  
the container top. Consequently, in particularly aggressive  
environments such as marine transport environments the goods  
contained in known containers can deteriorate.

25 The object of the invention is that of providing a container for  
bulk goods which can be loaded from above through hatches and which  
is of a structure such as to guarantee rapid assembly times and  
excellent sealing characteristics against water and moisture.

30 The said object is achieved by the invention according to which  
there is provided a container for the transport of goods in bulk,  
particularly powders or grains, of the type including a top

provided with a plurality of hatches closed in a fluid-tight manner by respective covers carried by the top itself close to the hatches, characterised by the fact that the said top comprises a plurality of respective first and second self-supporting panels of pressed sheet metal which are fixed together, co-planar with one another, the said second panels being formed integrally in one piece with the said hatches, which are formed by cutting and folding a circular central portion of the said second panels; these latter being moreover each securely provided with a respective said cover for an associated hatch, with locking means for the said cover and with reinforcement elements disposed around the hatch.

For a better understanding of the invention there is now given a non-limitative description of an embodiment, with reference to the attached drawings, in which:

Figure 1 illustrates a perspective view of a container formed according to the invention;

Figures 2 and 3 respectively illustrate in plan and in side view a detail of the container of Figure 1;

Figure 4 is a section taken on the line IV-IV of the detail of Figure 2; and

Figures 5 and 6 are, respectively, a plan view and a further detail of the container of Figure 1 and a side view in partial section of the detail of Figure 5.

With reference to the attached drawings, there is generally indicated with the reference numeral 1 a container for the transport of bulk goods such as powders and grains, which can be loaded from above through a plurality of respective hatches 2 disposed on a flat top 3 thereof and closed in a fluid-tight manner by respective covers 4 carried by the top 3 close to the hatches 2; the container 1 has a parallelepiped form and, according to the



invention, its top 3 comprises a plurality of associated self-supporting rectangular panels made of pressed sheet metal of two different types, respectively indicated with the reference numerals 5 and 6, which are connected to one another side by side, preferably by means of welding, and are disposed co-planar with one another; the panels 6 are constituted by normal flat panels free from any aperture and provided with a plurality of longitudinal reinforcing ribs 7; these are mounted on the container 1 with the ribs 7 disposed transversely with respect to the longitudinal axis of this latter and are fixed to respective longitudinal side frame members 8 and to the other associated panels immediately adjacent thereto on opposite sides, which in the specific example are the panels 5, these being disposed, according to the invention, alternating with the panel 6; the ends of the top 3, which in the example illustrated are formed by two panels 5, but which could be constituted also by panels 6, are fixed to respective terminal elements 9 of the top 3, in turn fixed to respective end frame members 10, for example by welding. According to the invention, the panels 5 are made integrally in one piece with the hatches 2, which are obtained by cutting and folding a circular central portion of the panels 5, effected in such a way that each hatch 2 (Figures 2 and 3) is formed by a respective circular hole 12 formed, in plan, passing through the centre of the respective panel 5, and by a respective edge 13 in relief, extending above and projecting over the respective panel 5 and folded into a U on the outside of the hatch 2; the respective cover 4 of each hatch 2 is fixed securely, according to the invention, to the respective panel 5 on which it is formed, and is cup shaped with the concavity facing the associated hatch 2 and houses within it, in correspondence with the folded edge 13, an annular seal 14 (Figure 6) snap fixed to a lower face 15 of the cover 4 by respective annular shoulder elements 16a and 16b and provided internally with an associated annular cavity 18 constituted by an annular groove

formed in correspondence with its upper face 19 and shaped in such a way as to be able to allow radial deformation of the seal 14 and its consequent adhesion to the whole of the surface of the folded edge 13 with the hatch 2 closed by the cover 4 as illustrated in  
5 Figure 6.

According to the invention, moreover, each panel is provided with respective locking means for the cover 4 and with reinforcement elements disposed within the hatch 2. In particular the  
10 reinforcement elements for the panels 5 comprise four rectilinear ribs 20 (Figures 2 and 4) formed on these by plastic deformation and disposed substantially along the sides of a parallelogram in such a way as to define, in plan around the hatch 2 a lozenge shape figure, in which the hatch 2 with the associated cover 4 and the  
15 said locking means is inscribed; the reinforcement elements further include four longitudinal ribs 21 formed by plastic deformation of the panels 5 close to respective corners thereof, in positions outside the said lozenge shape figure defined by the ribs 20. The locking means of the cover 4 carried by each panel 5 comprise,  
20 according to the invention (Figure 5) a hinge 25 of known type fixed to the upper face of the corresponding panel 5 on the mid-line of a longitudinal side 26 thereof, substantially in correspondence with one of the vertices of the said lozenge figure defined by the ribs 20, and respective rotary obstruction devices  
25 27 also of a known overall type, for cooperation with respective brackets 28 carried by and projecting laterally from the cover 4 and fixed (Figure 1) to respective panels 5 on the portion of these latter within the lozenge shape figure formed by the ribs 20. The devices 27 are preferably operable through levers 30 pivoted  
30 rotatably at 31 thereto and lockable by means of padlocks of known type and not illustrated for simplicity, to respective attachments 33 fixable by welding to the panels 5.

From what has been described the advantages of the container formed according to the invention are evident; the junction of several adjacent panels to form the top 3, although these are of different function and form, makes it possible to make the tops of the  
5 containers with normal constructional techniques thus guaranteeing impermeability thereof; this, then, is guaranteed in correspondence with the hatches 2 by the absence of any junction, in that the hatches are not fitted on but, according to the invention, formed integrally with the panels forming the components of the top, all  
10 without loss of rigidity or increase in costs thanks to the presence of the described reinforcement elements also formed integrally with each panel and obtainable, together with the hatches 2, with a single stamping operation; finally a perfect seal  
15 between the covers and the hatches is also guaranteed both by the presence of the edges 13 and by the shape of the seals 14 and by the disposition of the cover locking means.

CLAIMS

1. A container for the transport of goods in bulk, particularly powders or grains, of the type including a top provided with a plurality of hatches closed in a fluid-tight manner by respective covers carried by the top itself close to the hatches, characterised by the fact that the said top comprises a plurality of respective first and second self-supporting panels of pressed sheet metal which are fixed together, co-planar with one another, the said second panels being formed integrally in one piece with the said hatches, which are formed by cutting and folding a circular central portion of the said second panels; these latter being moreover each securely provided with a respective said cover for an associated hatch, with locking means for the said cover and with reinforcement elements disposed around the hatch.

2. A container according to Claim 1, characterised by the fact that the said panels are rectangular and the said reinforcement elements of the second panels comprise four rectilinear ribs formed thereon by plastic deformation and disposed substantially along the sides of a parallelogram in such a way as to define, in plan around the said hatch, a lozenge figure in which the hatch with the associated cover and the said locking means is inscribed; and four longitudinal ribs formed by plastic deformation of the said panels in correspondence with respective corners, in positions outside the said lozenge figure defined by the said ribs.

3. A container according to Claim 2, characterised by the fact that the said cover locking means of each hatch includes a hinge fixed to the corresponding second panel on the mid line of a longitudinal side thereof, substantially in correspondence with one of the vertices of the said lozenge figure defined by the said ribs, and by respective rotary obstruction members operable to

cooperate with respective brackets carried by and projecting laterally from the cover, and fixed to the second panel on the portion of this latter inscribed within the said lozenge figure.

- 5     4.     A container according to any preceding Claim, characterised by the fact that the said hatches are each provided with a respective edge in relief extending above and projecting up from respective said panels and folded into a U-shape over the exterior of the said hatch, the respective said cover of each hatch being  
10     cup-shape with the concavity facing towards the hatch and housing within it, in correspondence with the said folded edge of the hatch, an annular seal internally provided with a respective annular cavity able to allow radial deformation of the seal and its consequent contact over the whole of the surface of the said folded  
15     edge of the hatch when this is closed by the cover.

5.     A container for the transport of goods in bulk, particularly powders or grains, as described with reference to the attached drawings.

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